

Standard Operating Procedure

Subject: Mississippi River High Water Slope Profile

13 May, 2002

General Scope of Work:

A high water slope profile along the water surface of the Mississippi River shall be developed. The profile shall be accomplished through conventional techniques or through the use of GPS as specified by the C.O.R. The slope shall be developed from approximate Mississippi River mile 963=972 on the Ohio River to approximate River Mile 599 AHP on the Mississippi River. Due to high stages, access to boat ramps and launching facilities will require particular consideration by the A-E.

General Procedures (Conventional):

The Memphis District levee system will be divided among three QARs. The east levee system can be controlled by a single QAR with two survey aides. The west levee system will be controlled by two QARs with two Survey Aides each.

The locations for water surfaces to be run are listed in the attachment. A water surface differential elevation shall be run at each listed point. The differential shall be run from the high water mark to a nearby benchmark. The time and elevation differential shall be recorded in a standard fieldbook. Each temporary stake shall be well flagged so the tie-in crew will be able to locate the points with minimal effort.

Resources Required (Conventional):

1. Four, 3-man survey crews.
2. Historic data and benchmark information to be used as reference material.

Note: Crew size requirements will vary depending on Corps personnel availability. Historically, Corps personnel have been used in a Quality Assurance role and have been assigned to each crew as they develop data along the River. Safety of personnel is of the utmost importance, and as such, proper precautions shall be taken in the areas of communications and resources to ensure safe operation of the plan.

General Procedures (GPS):

In order to develop a high water slope profile through the use of GPS, a network of control points has been set throughout the District. The location of the control points is listed in the attachment. The general scenario for this operation is that base station GPS receivers will be deployed to two consecutive slope profile, (SP), control points beginning at the upper limits of the District. A minimum of two dual frequency rover units will be required to collect simultaneous fast static GPS observations on all high water marks between the base station setups. In addition, a minimum of four benchmarks shall be occupied between each dual base station setup to allow for vertical check-ins. Dual frequency carrier phase data is collected at 2 second intervals with a minimum of 5

SVs during the entire operation. Vertical computations shall be submitted in both NGVD29 and NAVD88 datums.

Resources Required (GPS):

- 2-Dual frequency Carrier Phase receivers to be used as base stations.
- 2-Dual frequency Carrier Phase receivers to be used as rover stations.
- 2-Personnel with vehicles to man base stations.
- 2-Personnel with vehicles to man rover units
- Computer equipment to download base and rover units at the end of each day.

Deliverables:

1. All field books used in the survey development. Field books shall be submitted in both hardcopy and as scanned Adobe Acrobat pdf format.
2. All monument recovery forms. Monument recovery forms are to be completed at the time of monument recovery. All field documentation forms shall be scanned and submitted as Adobe Acrobat pdf files.
3. Excel spreadsheet completed with updated reduced water surface elevations. Original spreadsheet to be supplied to the AE. In the event the Excel spreadsheet is unavailable, the AE shall reproduce the attachment for submittal.
4. If GPS is used, an ASCII text file shall be submitted containing all adjusted 3-D positions. Processed and adjusted GPS data shall be incorporated in the Excel spreadsheet.
5. If GPS is used, all raw and processed data files shall be submitted along with hardcopy printouts of the GPS message files. (Trimble)